

Appl. No. 10/694,684
Response dated 01/30/2006
Reply to Office Action of 11/28/2005

Attorney Docket No.: TS02-1193
N1085-90160

REMARKS/ARGUMENTS

Claims 1-31 were previously pending in this application with claims 22-30 withdrawn from consideration. Claims 12-21 have been allowed and claims 1-11 and 31 rejected. Claim 1 is now amended. Applicants respectfully request re-examination, reconsideration and allowance of each of presently pending claims 1-11 and 31 in addition to allowed claims 12-21.

I. Allowable Subject Matter

Applicants thank the Examiner for indicating, on page 3, third paragraph of the Office Action that claims 12-21 are allowed.

II. Claim Objections

On page 2, paragraph 1 of the subject Office Action, claims 1-11 were objected to because of various stated informalities including antecedent basis issues in independent claim 1. Claim 1 has been amended to address each of the stated informalities and Applicants respectfully submit that the objection to claim 1 and to claims 2-11, which depend directly or indirectly from claim 1, are obviated and the objection should therefore be withdrawn.

15 III. Claim Rejections Under 35 U.S.C. §102

In the Office Action, in particular page 3, seventh paragraph, claims 1, 2, 7, 10, 11 and 31 were rejected under 35 U.S.C. §102 (e) as being anticipated by Kim (U.S. Patent 6,767,788). Applicants respectfully submit that these claim rejections are overcome for reasons set forth below:

Claim 1 is an independent claim and claims 2, 7, 10, 11 and 31 depend from independent claim 1. Independent claim 1 has been amended and recites the following features:

forming at least one dual damascene opening directly adjacent and thereby exposing an associated one of the bottom electrodes; and

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depositing metal . . . in the at least one dual damascene opening such that the metal laterally contacts the associated bottom electrode directly.

The cited reference of Kim does not disclose or suggest the feature of forming at least

5 one adjacent dual damascene opening that provides direct contact to the bottom capacitor electrode(s). The subject Office Action acknowledges that "Applicant argues that Kim does not teach forming at least one adjacent dual damascene opening that provides direct contact to the bottom capacitor electrode" but further states "However, the claims are not so limited", subject Office Action page 2, last paragraph.

10 Amended independent claim 1 now clearly points out that the dual damascene opening(s) provides direct contact to the bottom capacitor electrode by reciting the above highlighted features: the dual damascene opening is directly adjacent the bottom electrode and exposes the bottom electrode; and the metal deposited in the dual damascene opening laterally contacts the associated bottom electrode directly. Clearly, amended claim 1 now recites the feature that the
15 dual damascene opening provides direct contact to the bottom capacitor electrode.

Moreover, the Office Action further alleges that "Kim discloses forming at least one dual damascene opening adjacent an associated one of the bottom electrodes, as shown in Figures 1D-1F", subject Office Action, page 2, last paragraph. Applicants respectfully traverse.

** Applicants submit that if the Office Action is referring to the un-numbered structures that
20 are laterally closest to the capacitance trench, i.e., laterally closest to via structure labeled 19 in Fig. 1B, but which appears in Fig 1D-1F, the claimed invention is distinguished from Kim because claim 1 recites the feature that the dual damascene opening is "directly adjacent and thereby exposing an associated one of the bottom electrodes." Kim does not provide this feature since the un-numbered structures of Kim are laterally spaced from the bottom plates of the

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capacitor electrode and are therefore not directly adjacent nor do they expose the bottom electrodes.

** Alternatively, if the Office Action is alleging that via 19 itself is the dual damascene opening adjacent one of the bottom electrodes, claim 1 is distinguished on the following grounds. The

5 structure in Kim (via 19) is necessarily formed before the bottom electrodes 20/21. See the process sequence in Figs. 1B- 1C in which the film which forms the structure alleged to be electrodes 20/21, is necessarily formed IN the dual damascene opening 19. Claim 1 recites the feature of: "forming at least one dual damascene opening . . . thereby exposing an associated one of the bottom electrodes. It is quite intuitive that, if the dual damascene opening exposes 10 one of the bottom electrodes as in claim 1, the step of forming the dual damascene opening must follow the formation of the bottom electrode(s) since the bottom electrode(s) must exist prior to the formation of the dual damascene opening if it/they are to be exposed by forming the dual damascene opening. Kim does not provide this feature since the bottom electrodes 20/21 are necessarily formed after the formation of the dual damascene opening, via 19.

15 Regardless of the characterization of the features of Kim, amended claim 1 is therefore distinguished from Kim which does not and cannot teach forming at least one dual damascene opening directly adjacent and thereby exposing an associated one of the bottom electrodes or the feature of depositing metal such that the metal laterally contacts the associated bottom electrode directly.

20 Since claim 1 is distinguished from Kim, the rejection of claim 1 under 35 USC § 102(e) as being anticipated by Kim, should be withdrawn. Claims 2, 7, 10, 11 and 31 each depend, directly or indirectly, from independent claim 1, distinguished as above. Since these dependent claims incorporate the distinguishing features of their base claim, they are similarly distinguished

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from Kim and, as such, the rejection of claims 2, 7, 10, 11 and 31 under 35 USC § 102(e) should also be withdrawn.

IV. Claim Rejections Under 35 U.S.C. §103

On page 3, second paragraph of the Office Action, claims 3-6, 8 and 9 were rejected 5 under 35 U.S.C. §103(a) as being unpatentable over Kim as applied to claims 1, 2, 7, 10, 11 and 31 and further in view of Wang, et al (U.S. Patent 6,589,862), hereinafter "Wang," as discussed in the June 1, 2005 Office action, and the Examiner's comments. Applicants respectfully submit that these claim rejections are overcome for reasons set forth below.

Claims 3-6, 8 and 9 depend from claim 1 which is distinguished from Kim for reasons set 10 forth above.

As appeared in the June 1, 2005 Office action, Wang has apparently been relied upon for providing materials such as Si₂, SiN, and SiON for use as etch stop layers. In the June 1, 2005 Office action, the Examiner indicated that the selection of suitable thicknesses for the various claimed layers would be obvious as a matter of determining optimum process conditions by 15 routine experimentation. The reference of Wang and the Examiner's comments do not make up for the above-stated deficiencies of Kim and therefore claim 1 and also dependent claims 3-6, 8 and 9 are distinguished from the references of Kim and Wang in view of the Examiner's comments and therefore the rejection of claims 1, 3-6, 8 and 9 under 35 U.S.C. §103(a), should be withdrawn.

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CONCLUSION

Based on the foregoing, each of claims 1-21 and 31 is in allowable form and the application therefore in condition for allowance, which action is respectfully and expeditiously
5 requested.

Applicants respectfully request entry of the amendments filed herein because the amendments place the application in condition for allowance.

The Assistant Commissioner for Patents is hereby authorized to charge any fees or credit any excess payment that may be associated with this communication to Deposit Account 04-
10 1679.

Respectfully submitted,


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Mark J. Marcelli, Reg. No. 36,593
Attorney for Applicants

20 DUANE MORRIS LLP
101 West Broadway, Suite 900
San Diego, CA 92101
Telephone: (619) 744-2200
Facsimile: (619) 744-2201